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CORAL SNAKES OF THE GENUS *MICRURUS* IN COLOMBIA

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More than thirty years have passed since the Hermanos Nicéforo and Apolinar María, of the Instituto de la Salle in Bogotá, Colombia, began their correspondence with various American museums, enlisting the aid, for the identification of Colombian animals of all kinds, of zoologists in museums of natural history in both North and South America. On various occasions Chicago Natural History Museum has been consulted, especially with regard to bats and venomous coral snakes of the genus *Micrurus* from Colombia. Occasional specimens collected by Hermano Nicéforo María have been retained for our collections, while other identified material has been returned.

When I engaged in renewed studies on coral snakes in 1951, my colleague, Philip Hershkovitz, was engaged in zoological field work in Colombia and was in close contact with the Museo de Historia Natural de la Salle, of which Hermano Nicéforo María is director. On the occasion of Mr. Hershkovitz' return to the Museum from his Colombian mammal survey, the available collections of coral snakes in the Museo de la Salle were packed up and sent along with him. These specimens nearly double the number of specimens I have been able to examine from Colombia and this accumulated material, amounting to 201 specimens, is the occasion for the present paper. I am indebted to Dr. Robert Mertens, Director of the Senckenberg Natur-Museum, for the loan of specimens of *Micrurus dissoleucus* for re-examination. I am further indebted to the John Simon Guggenheim Memorial Foundation and to the individuals and museums that have so generously entertained me in the past, and from whom I have borrowed specimens for the present study. I have examined specimens from the following institutions and private collections: the American Museum of Natural History (AMNH), the British Museum (Natural History) (BM),

the Museum of Comparative Zoology (MCZ), the Academy of Natural Sciences of Philadelphia (ANSP), Carnegie Museum of Pittsburgh (CM), and the Emmet R. Dunn collection (ERD).

Much of the material new to me is recorded by Hermano Nicéforo María (1942). There are gratifyingly few differences between his list and the present one. His map shows the localities named. H. Daniel (1949) has also listed these species, mainly following Amaral.

Any brightly colored snake with a pattern of red and black or of red, yellow, and black, in sharply defined but variously arranged rings, is commonly referred to as a *culebra corál* or simply as a *corál* in Latin American countries. Such snakes in Colombia include various harmless species of the families Anilidae and Colubridae. The snakes of the genera *Micrurus* and *Leptomicrurus* are the only types of the venomous Elapidae in South America. *Leptomicrurus narducci* barely enters Colombia in the Amazonian headwaters; *Micrurus*, however, ranges throughout Colombia with a bewildering diversity of forms.

The snakes of the genus *Micrurus* in Colombia are distinguished, of course, from those harmless snakes that have a similar bicolor or tricolor ringed pattern, by the presence of the enlarged, venom-conducting fang on the maxillary bone. This is normally the only tooth on the maxilla, but when the replacement tooth persists there may be two fangs side by side. If a living snake is to be determined, the venomous *Micrurus* lack the loreal plate on the side of the snout and never have the black rings in pairs.

The fifteen species and twenty subspecies are the following:

Micrurus mipartitus mipartitus
mipartitus semifasciatus
nigrocinctus mosquitensis
carinicaudus carinicaudus
carinicaudus antioquiensis
carinicaudus transandinus
dumerili
ecuadorianus sangilensis
nicefori
psyches

Micrurus ornatissimus
ancoralis jani
dissoleucus dissoleucus
dissoleucus melanogenys
dissoleucus nigrirostris
lemniscatus
filiformis
spixi obscurus
surinamensis surinamensis
hemprichi orton

A tentative key for the identification of these species and subspecies has been drawn up. The difficulties arising in the cases of subspecies not sharply defined will be discussed under the headings of the species *carinicaudus* and *dissoleucus*.

1. Black rings in well-defined groups of three, these "triads" separated by red zones 7
Black rings not in triads 2
2. A broad red band across anterior part of parietals, usually across posterior tip of frontal shield 3
Top of head black, usually covering most of parietals, with or without a narrow light band across snout 4
3. Black rings very numerous (41 to 76), the light spaces between them (red in life, often yellowish or white in preserved specimens) usually narrower than the black rings *Micrurus mipartitus*
(See text for distinction of subspecies.)
Black rings few, widely separated by much broader red rings.
Micrurus nigrocinctus mosquitensis
4. Top of head with two narrow light crossbands, one across snout, one across parietals *Micrurus nicefori*
No light crossband on snout; parietal light band usually bordering parietals 5
5. Red zones usually much wider than black *Micrurus carinicaudus*
(See text for distinction of subspecies.)
Red zones, if distinguishable, about equal in length to black 6
6. Yellow rings reduced to spots (i.e. to half-scales adjacent to the black rings); anterior head shields, at least the supraoculars, each with sharply defined light spot *Micrurus ornaticinctus*
Yellow rings continuous; red rings, if distinguishable, greatly obscured by invasion of dark pigment *Micrurus psyches*
7. Anal plate entire *Micrurus hemprichi ortonii*
Anal plate divided 8
8. Head with a narrow light crossband on snout and a broader one across parietals 9
No crossband on snout; parietal crossband present or absent 10
9. A moderately slender snake, ventrals 220-263, triads of black rings 8-14 (9-11 in Colombia) *Micrurus lemniscatus*
Body very slender, ventrals 266-321, triads 11-20 (av. 16) *Micrurus filiformis*
10. Head with black pileus, a narrow light post-parietal band broadened on the temporals and posterior labials (as in *carinicaudus*) 11
Head variously colored; if black, the scales sharply outlined with light 12
11. Outer black rings of triad much narrower than middle one. *Micrurus dumerili*
Outer black rings of triads subequal to middle one.
Micrurus ecuadorianus sangilensis
12. Top of head light, the upper head scales all sharply outlined with black; frontal shield very narrow *Micrurus surinamensis surinamensis*
Top of head not light, with dark bordered head shields; frontal normal in shape 13
13. Head with broad light crossband across posterior ends of supraocular and frontal shields and anterior ends of parietals; snout black; nuchal ring not part of first triad *Micrurus dissoleucus*
Top of head without well-defined light crossband 14
14. Yellow rings very wide, as wide as outer black rings of the triads, top of head dark, the shields with light outlines *Micrurus spixi obscurus*
Yellow rings narrower above than outer black rings of triads; head light anteriorly, with black spots *Micrurus ancoralis jani*

In this key I have avoided the adult male character of presence or absence of supra-anal tubercles, feeling that the student or teacher with a single female or juvenile coral snake at hand would be hopelessly frustrated if faced with this alternative. Nevertheless, this character so greatly sharpens the taxonomic distinction of *sangilensis*, *psyches*, and *ornatissimus* (which do not have it) as compared with *dumerili* and *carinicaudus*, that it must again be pointed out that the determination of this character for each species is essential before it can be brought into the system. This feature is unknown for *Micrurus nicefori*. The tubercles are present in adult male *mipartitus*, but not developed to the extreme of *carinicaudus* or *nigrocinctus*.

LIST OF SPECIES

Micrurus mipartitus Duméril and Bibron

Elaps mipartitus Duméril and Bibron, 1854, Erpét. Gén., 7: 1220—Rio Sucio.

Micrurus mipartitus Ruthven, 1922, Misc. Publ. Mus. Zool. Univ. Mich., 8: 68.

Diagnosis.—A coral snake with alternating black and red bands, the black bands wider, a broad red band across the posterior part of the head; a tendency to very high numbers of ventrals (up to 326); tail short, caudals 20–38; supra-anal tubercles present in adult males, mainly post-anal.

Discussion.—The fortunate circumstance that Duméril and Bibron named Rio Sucio as type locality of *Elaps mipartitus* greatly simplifies the problems of nomenclature for this species, which exhibits great variability and some obscure geographic partition into subspecies. The ventrals in this species range from 214 to 326; such a wide variability is to be expected in a character that tends to the extreme—and is not yet phylogenetically fixed. The extremes of variation are much less in geographically limited regions; but the range of variation is nevertheless so great as to prevent any very accurate analysis into subspecies. A Central American, a Colombian, and a Colombo-Venezuelan subspecies may tentatively be recognized:

Ventral plates 234–260 in males, 263–274 in females, Nicaragua to Panama.
mipartitus multifasciatus

Ventral plates 244–289 in males, 251–326 in females, Colombia west and south
of Santa Marta mountains. *mipartitus mipartitus*

Ventral plates 214–239 in males, 233–260 in females, Santa Marta region eastward
to Caracas, Venezuela. *mipartitus semipartitus*

***Micrurus mipartitus mipartitus* Duméril and Bibron**

Micrurus multiscutatus Rendahl and Vestergren, 1940, Ark. Zool., 33A, no. 1, pp. 1-16.

The typical subspecies ranges from Darien, Panama, to western Ecuador, and the populations thus far known from the Cauca and Magdalena valleys are only feebly distinguished from the trans-Andean ones. The variation in ventrals is as follows:

	No. of specimens	Ventrals	Average
Trans-Andean.....♂	10	259-289	270
♀	9	253-326	297
Cauca Valley.....♂	5	244-273	259
♀	8	280-325	296
Magdalena Valley.....♂	2	246-265	255
♀	5	251-282	264
Santa Marta region.....♂	6	224-234	231
♀	8	250-260	256
Venezuela.....♂	7	214-239	228
♀	9	233-258	247

The extent of variation in *Micrurus mipartitus* was not understood by Rendahl and Vestergren (1940), who established a supposed new species, *M. multiscutatus* for specimens from El Tambo in the Cauca Valley, based on three specimens with ventrals "more numerous than in any known species of *Micrurus*." The ventrals in their types and cotypes number 295, 328, and 329. The range of ventrals in eight female specimens from the Cauca Valley examined by myself is from 280 to 325, and from Colombia west of the Cordillera Occidental (nine specimens) from 253 to 326. The low counts within these ranges are quite uniformly bridged over to the highest by intermediate ones. The El Tambo specimens do represent the extreme of high ventrals in *mipartitus*; but a distinct form for the upper Cauca Valley is not discernible; if there should be a subspecies in this area, the name *mentalis*, Boulenger 1896, would be available for it.

***Micrurus mipartitus semipartitus* Jan**

Elaps semipartitus Jan, 1858, Rev. Mag. Zool., 1858: 113.

The tabulation above shows that the variation in ventrals in the Santa Marta *mipartitus* comes much closer to that of the Venezuelan form than to that of central and western Colombia. I do not have at hand the material of this species of the Museo de la Salle, and

without much additional material it is profitless to examine further into the variation of *mipartitus*.

Micrurus nigrocinctus mosquitensis Schmidt

Micrurus nigrocinctus mosquitensis Schmidt, 1933, Field Mus. Nat. Hist., Zool. Ser., 20: 33—Limón, Costa Rica.

Diagnosis.—A subspecies of *nigrocinctus* characterized by much lower numbers of ventrals in both sexes than are to be found in *nigrocinctus nigrocinctus*. The species *nigrocinctus* as a whole is allied to the Colombian *carinicaudus* in its pattern of widely spaced black rings with narrow yellow rings bordering the black, in having the sexes sharply distinct in tail length, and the adult males with well-defined supra-anal tubercles.

Range.—The Caribbean slopes of Central America from Costa Rica to northwestern Colombia.

Colombian specimens.—A male specimen from Turbo, Antioquia, MLS no. 602, collected in May, 1943, forms the sole record for the *nigrocinctus* group in Colombia. This specimen agrees excellently with the original description of *mosquitensis*; it has 195 ventrals; 52 caudals, of which 2 are entire; and 18 black rings on the body, with 5 on the tail.

Micrurus carinicaudus Schmidt

Micrurus carinicauda Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 194—Orope, Zulia, Venezuela; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98.

Diagnosis.—A coral snake with black rings not in triads, with narrow yellow borders often not discernible in preserved specimens, the red zones always longer than the black; top of head black, no red crossband on the anterior portion of the parietal shields; sexes sharply different in tail length, adult males with strongly developed supra-anal tubercles.

Range.—From the Maracaibo Basin eastward as far as Caracas, westward to the Magdalena Basin, and southward along the central Andes to the latitude of Bogotá.

Remarks.—The species *carinicaudus* is the common coral snake of northern and central Colombia. The three subspecies, *c. carinicaudus*, *c. antioquiensis*, and *c. transandinus*, are not sharply definable, and though their intergradation has not yet been traced, their ranges are expected to meet in the northern lowlands of Colombia.

***Micrurus carinicaudus carinicaudus* Schmidt**

Diagnosis.—Distinguished from the two western subspecies by its higher number of black rings and in having the nuchal ring present and complete. In Magdalena Valley intergradient specimens the number of rings may be high, with much irregularity of the nuchal ring.

Range.—Northwestern Venezuela to Santander Norte, Colombia, with intergradient specimens from Olanche, Landazuri, Sasaima, and Charala in Cundinamarca.

Colombian specimens.—Specimens from Bucaramanga, Gramalote, Catatumbo, Chimacote, and Cúcuta are unequivocally assignable to the typical subspecies. The 17 specimens from Cundinamarca agree with *c. carinicaudus* in their high average number of black rings, but tend strongly to reduction of the nuchal ring, which is a half-ring or is otherwise irregular in seven specimens. In 10 male specimens the black rings vary from 14 to 24; in 14 female specimens the rings range from 17 to 27.

***Micrurus carinicaudus antioquiensis* Schmidt**

Micrurus antioquiensis Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 195—Santa Rita, north of Medellín; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98.

Diagnosis.—Distinguished from the coral snakes of the non-triad type west of the Andes (*Micrurus carinicaudus transandinus*) by having the nuchal ring reduced or irregular in the majority of specimens; and from *carinicaudus carinicaudus* by a much smaller number of black rings, average 14.

Range.—Restricted to the Cauca Valley, but intergrading over a broad area in the Magdalena Valley with *c. carinicaudus*.

Colombian specimens.—In the six male and five female specimens from the Cauca drainage (Medellín and vicinity and Segovia) five have the nuchal ring wanting and four have it reduced to a half ring; it is very irregular in one and normally developed as a complete ring in one. The number of black rings on the body in this series ranges from 10 to 17, averaging 14.

***Micrurus carinicaudus transandinus* Schmidt**

Micrurus transandinus Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 195—Andagoya, Choco, Colombia; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 100.

Diagnosis.—A coral snake of the species *carinicaudus* with normal nuchal ring and with relatively few black rings on the body (11–21, average 15).

Range.—The Choco region west of the Andes from the Gulf of Urabá to Ecuador.

Colombian specimens.—The large series of *transandinus* now available is relatively uniform in both coloration and scutellation. In fifteen male specimens the range of ventrals and caudals is 194 to 204 and 50 to 58, with 11 to 16 black rings on the body. In fifteen females the ventral range is 208 to 217, caudals 36 to 42, black rings 14 to 21. The localities represented are Pueblo Rico, Condoto, Andagoya, Barbacoas, and Acandí.

***Micrurus dumerili* Jan**

Elaps dumerilii Jan, 1858, Rev. Mag. Zool., 1858: 522—Cartagena.

Micrurus dumerilii Ruthven, 1922, Misc. Publ. Mus. Zool. Univ. Mich., 8: 68; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98.

Diagnosis.—A species of *Micrurus* with a black pileus, with the middle black band of the first triad as the nuchal band; accessory black bands in the triads narrow; strongly developed supra-anal keels in adult males.

Range.—From Cartagena to the Santa Marta region, southward to Santander do Norte.

Colombian specimens.—This species is confined to Colombia; a specimen in the Museo de la Salle, no. 545, was collected south of the Santa Marta region—the first known extension of its range.

In this form, as in *Micrurus ecuadorianus*, I am certain that the triad arrangement of the black ring is developed independently of that of the great number of triad-ringed species of South America. Black pigment, originally distributed throughout the red zones, becomes concentrated at the borders of the yellow zones, and this produces the primitive triad arrangement. I regard *dumerili* as closely allied to *carinicaudus*.

***Micrurus ecuadorianus sangilensis* Nicéforo María**

Micrurus ecuadorianus sangilensis Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98, pl. 3, fig. 10—San Gil, Santander, Colombia.

Diagnosis.—A coral snake with black pileus, with the black bands in triads, with the nuchal band the middle band of the first triad, and without supra-anal tubercles in the adult male.

Range.—Confined to the region between the Cordillera Central and the Cordillera Oriental, northern Colombia.

Colombian specimens.—The range of variation of the specimens at hand (8) falls within that of the larger series of paratypes described by Nicéforo María.

Micrurus ornatissimus Jan

Elaps ornatissimus Jan, 1858, Rev. Mag. Zool., 1858: 521—Mexico (corrected to Colombia, and restricted to Rio Putumayo).

Micrurus ornatissimus Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 191.

Micrurus mimosus Amaral, 1935, Mem. Inst. Butantan, 9: 221, fig. 6—Rio Putumayo; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 99, pl. 3, fig. 11.

Diagnosis.—A coral snake with a light spot on each supraocular shield in most specimens, black rings not in triads, the black rings edged with very narrow yellow rings that are reduced to yellow spots on half scales, so that the yellow rings are discontinuous. The red rings are subject to darkening with black pigment and the black rings to fading, producing an almost uniform coloration from which the yellow half-scales stand out as strikingly distinct spots; the venter fades to complete loss of the dark rings.

Range.—Region of headwaters of the Amazon, from the Rio Caquetá in Colombia to southern Peru. Occasional specimens from the lower Amazon are regarded as having been transported, accidentally or by human agency.

Colombian specimens.—The three specimens at hand are from La Pedrera, Rio Caquetá, from Putumayo, and from Puerto Asis, Putumayo. These three specimens agree in having the diagnostic character of *ornatissimus*, in the presence of a light spot on each of the supraocular scales; their dark bands are alternately lighter and darker, corresponding evidently to alternating red and black zones; the venter in all three is at first glance without markings.

When the coloration is attentively examined, it is found that the black rings can plainly be seen on the smallest specimen; that in another specimen (the largest), they cannot be seen at all; and that in the other, the red rings can be detected, with no trace whatever of black or yellow rings ventrally. These seem to be stages in fading with exposure to light after preservation, rather than ontogenetic changes in the color pattern. There is much about *ornatissimus* that is not understood, and description of the pattern

from life is especially required. Differential fading of the several colors is well known in coral snakes. In *Micrurus mipartitus*, for example, the light rings of the body are red in life but may be yellowish or white in preserved specimens, while the bands across the head and tail are still distinctly red. I hope to return to the *ornatissimus-langsdorffi* problem in discussing the larger series of specimens now available from Ecuador and Peru.

***Micrurus psyches* Daudin**

Vipera psyches Daudin, 1803, Hist. Nat. Rept., 8: 320, pl. 100, fig. 1—Surinam.

Micrurus psyches Beebe, 1919, Zoologica, 2: 216; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 100, pl. 3, fig. 9.

Diagnosis.—A coral snake with numerous black rings alternating with narrow yellow (or white) ones, with the alternate black rings distinguishably different in width; these alternate rings sometimes much lighter in color, evidently red rings with the scales darkened by black pigment; top of head black, without crossbands, with a narrow light band separating the black pileus from the nuchal ring; no supra-anal tubercles in adult males.

Range.—The Guiana region to the Orinoco Basin, and thus in the Meta drainage at Villavicencio, Colombia.

Colombian specimens.—Three specimens from Villavicencio have very slightly higher scale counts than Guianan specimens. MLS no. 576, a male, has ventrals 201, caudals 50, with 37 + 8 black rings (all the rings dead black). MLS 573 and 574 have ventrals 217 and 214, caudals 33 and 30, and alternating black and darkened red rings, 26 + 25 and 23 + 22 on the body, black rings on tail 5 in both.

***Micrurus nicefori* sp. nov.**

Micrurus mipartitus subsp. Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 99.

Type.—A juvenile male specimen from Villavicencio, Cundinamarca, collected in 1937 by Nicéforo María; Museo de la Salle no. 571.

Diagnosis.—A species of *Micrurus* with a high ventral count; numerous alternating black and light rings, the black rings not arranged in triads, not alternately wider and narrower; the head black, with a narrow light crossband across the prefrontals and a second one across the posterior part of the parietals.

Description of type.—Body slender, head not distinctly wider than body, tail short; eyes of moderate size, their distance from the labial border about one and a half times their diameter; head shields in normal arrangement; upper and lower labials 7 on each side; a single preocular and 2 postoculars on each side; temporals

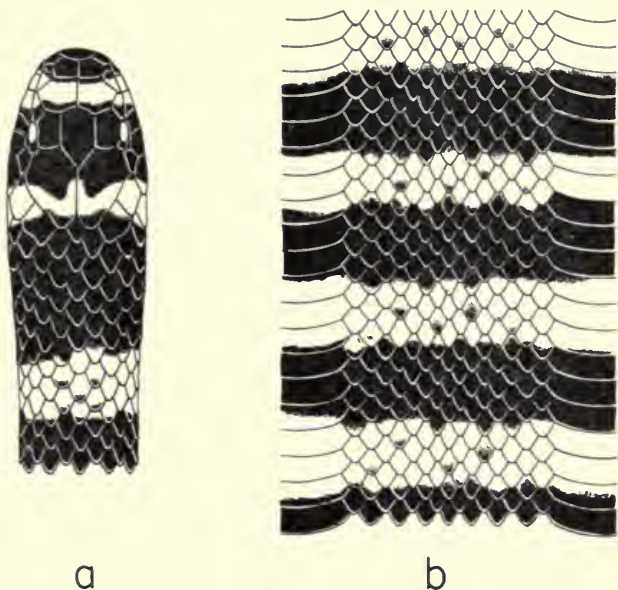


FIG. 65. *Micrurus nicefori* sp. nov. a, pattern of head and neck; b, pattern of body.

1-1, with a large post-temporal along the parietal shield, on each side; the sixth upper labials and the parietals widened so that they nearly separate the anterior and posterior temporals; ventrals 244 (counted from the chin shields); anal divided; caudals 37, all divided.

Head black above; a narrow light band on the snout extending from the third labial on each side across the prefrontals; an equally narrow band from the seventh upper labials crossing the posterior temporal and the post-temporal and the parietals, with a forward projection on the temporal suture, the tips of the parietals being black; labial border black beneath, middle of chin light with obscure black spots. Nuchal ring open below, extending from the posterior ends of the parietals to the sixth scale behind them.

Black rings, including the nuchal, 52 (two divided so that on one side they may be counted as 54); black rings two to three ventrals

in length; light rings (presumably red in life) usually two ventrals in length, rarely three; a few of the scales in the light rings with small dark spots; tail with seven dark rings and the intervening light rings dark-spotted like those on the body.

Measurements.—Total length 270 mm., tail 23 mm.; diameter of body 3.5 mm.

Remarks.—As Hermano Nicéforo María relates, this specimen has passed through my hands before (probably about 1938) and through those of Dr. Alcides Prado of the Instituto Butantan. We both reported it to him as undescribed and returned his specimen with the hope that additional ones might turn up in order to provide a better basis for a description. I still find no possible allocation for this specimen among the known species. I am now much more impressed than formerly with the validity of the characters of the color pattern in *Micrurus*, and I do not regard the new form as subspecifically related to *mipartitus*, of which I have examined large numbers of specimens. Lest the type be worn out in further travels, I have given this little coral snake waif a name.

***Micrurus hemprichi orton* Schmidt**

Micrurus hemprichi orton Schmidt, 1953, *Fieldiana, Zool.*, **34**: 166—Pebas, Peru.

Micrurus hemprichii Nicéforo María, 1942, *Rev. Acad. Colomb. Ciencias*, **5**: 99.

Diagnosis.—A species of coral snake of the genus *Micrurus* with the anal plate entire; with the black rings in groups of three (triads); and with 5 to 6 triads on the body.

Range.—The region of the upper Amazon.

Colombian specimens.—Only a single specimen from Colombia is at hand, MLS no. 568, from Florencia, Caquetá. The specimen recorded by Nicéforo María from Putumayo appears to represent another record. In the present specimen, a female, the ventrals number 187; the caudals 30, with four undivided; and the black triads 5, with only two-thirds of a triad on the tail. The total length is 760 mm., tail 72 mm.

The type locality of *hemprichi* was "Colombie," but the description of the type places it unequivocally with the Guianan series, and as the species has not been recorded from Venezuela, and as I believe Jan's statement of the origin of his specimen to be in error, I have suggested as amended type locality "Vicinity of Bartica,

British Guiana." The Guianan subspecies has 7 to 10 triads on the body instead of 5 to 6 as in *ortoni*.

Micrurus surinamensis surinamensis Cuvier

Micrurus surinamensis surinamensis Schmidt, 1952, Fieldiana, Zool., **34**: 29.

Micrurus surinamensis Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, **5**: 100.

Diagnosis.—A coral snake with the black rings in triads; the head broad, with a distinctively narrow frontal shield; the shields of the top of the head all red, narrowly outlined with black; ventrals 162–174 in males, 173–187 in females.

Range.—The headwaters of the Amazon tributaries, northward to Villavicencio (Orinoco drainage); the Guiana region.

Colombian specimens.—The Museo de la Salle has two specimens, MLS no. 592, a male, from Villavicencio, and no. 593, a female, from Tres Esquinas, Rio Ortegua, Caquetá. In the male specimen the ventrals number $172\frac{1}{2}$, the caudals 34 (with 12 undivided); the temporals are 1–2 on each side, and the triad formula is $6\frac{2}{3} + \frac{1}{3}1$ (body + tail). In the female specimen the ventrals number 169, the caudals 31 (two undivided), the temporals are 1–2, and the total length is 495 mm., tail 54 mm. In this specimen the triads, about $8 + \frac{1}{3}1$, are somewhat irregular, obscured dorsally by a general darkening of the red zones, and still more by the irregular fusion of black rings posteriorly, where they may be arranged in "quadrads."

I have examined also a specimen in the British Museum labeled Villeta, and one from Puerto Boy, Caquetá, sent by Hermano Nicéforo María for my examination on an earlier occasion; and Amaral records a second specimen from Villavicencio, likewise from the Museo de la Salle.

Micrurus lemniscatus Linnaeus

Coluber lemniscatus Linnaeus, 1758, Syst. Nat., ed. 10, p. 224—Asia (in errore; type locality restricted to lower Amazon region).

Micrurus lemniscatus Beebe, 1919, Zoologica, **2**: 216; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, **5**: 99.

Diagnosis.—A coral snake of the genus *Micrurus* of slender habitus; head with a distinctively small eye; black rings in triads, of which the first is invariably a complete group of three; always with a light crossband across the head anterior to the eyes.

Range.—The Amazon and Orinoco basins, extending to Trinidad and the Guianas; the species reaches Colombia along the Putumayo and Caquetá rivers and occurs at Villavicencio, in the drainage of the Meta.

Colombian specimens.—The Colombian specimens available for examination, all collected by Nicéforo María, agree closely with the Amazonian population. In seven males the ventrals range from 236 to 252, and the caudals from 34 to 41; in four females these ranges are respectively 243 to 261 and 40 to 43. The number of triads of black rings in the whole series varies from 9 to 11 on the body and from $1\frac{1}{3}$ to 2 on the tail. The largest specimen, a skin, may be estimated as a little more than a meter in length, the length of the tail being 93 mm.

The Colombian localities from which *lemniscatus* has been received are Florencia, Rio Orteguaza, and Rio Putumayo, Intendencia del Caquetá, and Villavicencio, Cundinamarca.

Micrurus filiformis Günther

Elaps filiformis Günther, 1859, Proc. Zool. Soc. London, 1859: 86, pl. 17
—Pará, Brazil.

Micrurus filiformis Amaral, 1925, Proc. U. S. Nat. Mus., 67, Art. 24, p. 19;
Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 99.

Diagnosis.—An elongate and excessively thin-bodied species in which the elongate character of *lemniscatus* is exaggerated; with the *lemniscatus* head and body pattern, but with more numerous triads and a higher ventral count in both sexes.

Range.—Known throughout the northern Amazon Basin, absent in the Guianas, reaching Colombia along the Putumayo and Caquetá rivers, northward to Villavicencio at the headwaters of the Meta.

Colombian specimens.—The three available specimens, all male, are from Villavicencio, Cundinamarca; and from Puerto Boy and La Pedrera, Intendencia del Caquetá. Ventrals range from 266 to 281, caudals 39 to 41, and triads of black rings 12 to 16. The longest specimen measures 540 mm., tail 44 mm.

Micrurus spixi obscurus Jan

Elaps corallinus var. *obscura* Jan, 1872, Icon. Gen. Ophidiens, 41: pl. 6,
fig. 3—Lima (in errore; corrected to eastern Peru).

Micrurus spixii obscura Schmidt and Walker, 1943, Field Mus. Nat. Hist.,
Zool. Ser., 24: 294.

Micrurus spixii spixii Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias,
5: 100.

Diagnosis.—A large coral snake with stocky body and very short tail, the black rings arranged in triad groups in which the yellow rings are as broad as or broader than the outer black rings; the nuchal black marking (the middle ring of a triad) has a forward projection extending to the parietals; there are usually a number of entire subcaudals.

Range.—*Micrurus spixi* ranges throughout the Amazon Basin, but is absent from the Guianas and most of Venezuela. The subspecies *obscurus* ranges from northern Bolivia through Amazonian Peru and Ecuador to Colombia; it is replaced in Amazonas by the typical *spixi spixi*.

Colombian specimens.—The seven Colombian specimens are from Florencia, Puerto Boy, and Rio Putumayo, Intendencia del Caquetá. In the six males the ventrals range from 211 to 215, the caudals from 17 to 22 (0 to 10 entire). In the single female specimen the ventrals number 219 and caudals 19 (6 entire). The number of triads of black rings on the body (as seen from above) is 5 in five specimens, with the posterior two-thirds of a triad on the neck and an anterior two-thirds of a triad on the tail. In two specimens the nuchal triad is complete, and the triad formula is $6 + \frac{2}{3}$. The anterior member of the first triad is present on the parietal shield, usually broken into spots or otherwise obscure; on the under side of the head it is present as a narrow transverse half-ring in the five specimens listed as having two-thirds of a triad anteriorly. In other subspecies of *spixi* this anterior ring is much more obscure; and the two specimens, MLS 580 and 589 (both from Florencia) are the only ones known in *obscura* in which the anterior ring is fully complete on the upper side.

The largest specimen, a male from Puerto Boy, measures 884 mm., tail 46.

***Micrurus ancoralis jani* Schmidt**

Micrurus ancoralis jani Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 197—Andagoya, Choco, Colombia; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98.

Diagnosis.—An elongate but stout-bodied coral snake with the black rings in triads, and with an "anchor-shaped" nuchal marking; ventrals 248–266 in males, 271–290 in females; triads on body 12–15 in males, 14–16 in females.

Range.—The Choco region of Colombia, northward to Panama.

Colombian specimens.—For my original description I had eighteen specimens, and only four additional specimens have appeared in the intervening years, two in Chicago Natural History Museum and two in the Museo de la Salle. One of these latter exceeds a meter in length, and this specimen has temporals 1–2 on each side (1–1 in all others). In range of ventral count and in color pattern these specimens agree fully with the original series. *Micrurus ancoralis jani* is known from Tado, Condoto, Pena Lisa, Novita, Pueblo Rico, and Andagoya, all in the Rio San Juan drainage, and from Quibdo (MLS 500 and 501) on the upper Atrato.

Micrurus dissoleucus Cope

Elaps dissolculus Cope, 1859, Proc. Acad. Nat. Sci. Phila., 11: 345—Venezuela.

MATERIAL EXAMINED

PANAMA: Panama City, MCZ 38244; Juan Diaz, MCZ 49943; Aguadulce, AMNH 67058; no locality, ERD Coll., no number (1), Munich, no number (1), ANSP 7173, 22602-35. CANAL ZONE: Ancon, MCZ 16304 (type of *dunni*); Golf Club, MCZ 45405; Corozal, MCZ 18813.

COLOMBIA: No other data, or questioned data, MCZ 29602; "Trinidad," AMNH 3912; "Cartago," AMNH 20407. Bolivar (by inference): Magdalena Valley, ANSP 6806, BM 1902-5-15-20. Atlantico: Barranquilla, MLS 542, Senckenberg Mus. 20734-5, 43586, Berlin 3853 (2); mouth of the Magdalena, Vienna, no number (3). Magdalena: Salamanca Island (east of Barranquilla), Vienna, no number (4). Santa Marta, CNHM 2050, MCZ 15967; Bonda, CM 206 (type of *hollandi*), 207; no data, ANSP 6807 (type of *melanogenys*), AMNH 45095-96. Norte de Santander: Cúcuta, CNHM 5685. 27009. MLS 537. 539.

VENEZUELA: No other data, ANSP 6781 (type of *dissoleucus*). Federal District: Caracas, Munich, no number (1); El Valle, AMNH 59393; Puerto La Cruz, CM 7346. Aragua: Maracay, Munich, no number (5); Fijirias, Munich, no number (1); Pie del Cerro, CM 7397. Zulia: Maracaibo, Basel 2309-10; Cabinas, BM 1932-12-5-1.

Diagnosis.—A small species of coral snake of the genus *Micrurus*, rarely exceeding 400 mm. in length (maximum known 620 mm.); tail relatively short but with distinct sex dimorphism in length; the black rings in triads; the nuchal ring representing the posterior ring of a triad; triad formula $\frac{1}{3}6$ to $\frac{1}{3}11$ for the body, and $\frac{2}{3}$ to $1\frac{2}{3}$ for the tail; no light crossband on the snout; head crossed posteriorly by a broad light band. Four subspecies may be recognized.

Synopsis of subspecies of Micrurus dissoleucus:

1. Caudals in males 23-28.....2
Caudals in males 21-22.....*dissoleucus melanogenys*
(Santa Marta region)

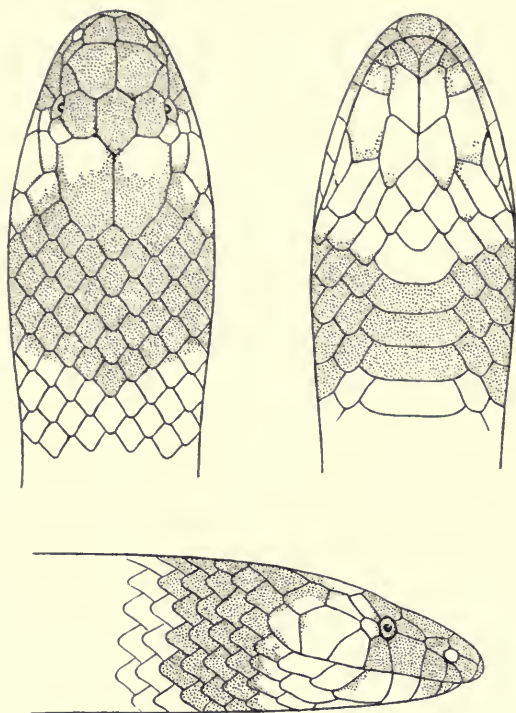


FIG. 66. Pattern of head of type of *Micrurus dissolucus* Cope, ANSP no. 6781; $\times 2$.

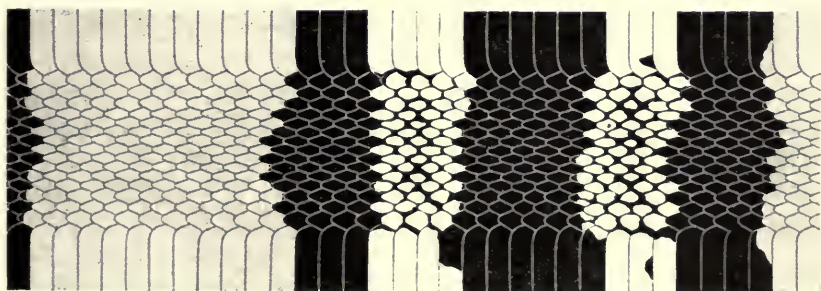


FIG. 67. A triad of black rings at mid-body in type of *Micrurus dissolucus* Cope, ANSP no. 6781.

2. Ventrals in females fewer than 212.....*dissoleucus dissoleucus*
(northeastern Colombia and northwestern Venezuela)
Ventrals in females more than 212.....3
3. Triads of black rings (in both sexes) 6-8.....*dissoleucus nigrirostris*
(lower Magdalena region)
Triads of black rings 8-11.....*dissoleucus dunni*
(Panama and presumably adjacent Colombia)

Comparisons.—By way of amplification of the comparison of the subspecies of *dissoleucus* in the key above, the range of variation in numerical characters may be tabulated as follows:

	No. of specimens	Ventrals	Caudals	Triads	Average of triads
<i>dissoleucus</i> ♂	8	175-201	24-28	8-10	9
♀	10	201-212	21-23	6-11	9
<i>melanogenys</i> ♂	3	185-199	21-22	6-9	7
♀	4	197-210	17-19	7-8	7
<i>nigrirostris</i> ♂	11	190-208	23-27	6-8	7
♀	7	212-228	17-22	7-8	8
<i>dunni</i> ♂	8	185-200	24-26	8-10	9
♀	3	208-217	19	10-11	10

Distribution.—The vicariating subspecies extend along the Caribbean versant of South America from as far east as Caracas in Venezuela to the Canal Zone and to the Pacific coast in Panama. They occur inland in Venezuela to moderate altitudes but are otherwise characteristically lowland forms. The subspecies *melanogenys* is narrowly separated from *nigrirostris* of the Magdalena delta by the Cienega de Santa Marta. The typical subspecies extends into Colombia in the region of Cúcuta, rather well separated from the range of the Santa Marta subspecies by the barrier of the Sierra de Perija. There is no presumable barrier between the subspecies *nigrirostris* and the Panamanian *dunni*, and it is somewhat to be inferred that the latter form may reach Colombia. There is a gap of some 500 km. between the known ranges of *dunni* and *nigrirostris*.

Micrurus dissoleucus dissoleucus Cope

Micrurus dissoleucus dissoleucus Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 202; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98.

Diagnosis.—A small species of coral snake in which the nuchal black ring is not part of the first triad on the body; head crossed posteriorly by a broad light band; no light crossband on snout; tail relatively short; caudals 21-23 in females, 24-28 in males;

ventrals 201–212 in females, 175–201 in males; and triads of black rings on the body averaging 9 in both sexes.

Range.—From northeastern Colombia (North Santander) eastward through northern Venezuela to Caracas.

Colombian specimens.—This species occurs at Cúcuta; Nicéforo María gives the additional localities El Rosario, Rio Tulia, Puerto Santander, and Petrolea. I do not have the Museo de la Salle series at hand.

***Micrurus dissoleucus melanogenys* Cope**

Elaps melanogenys Cope, 1860, Proc. Acad. Nat. Sci. Phila., 12: 72—South America (restricted to Santa Marta region, Colombia).

Elaps hollandi Griffin, 1916, Mem. Carnegie Mus., 7: 218, pl. 18, figs. 10–12—Bonda, Colombia.

Micrurus dissoleucus melanogenys Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 203; Nicéforo María, 1942, Rev. Acad. Colomb. Ciencias, 5: 98 (part only).

Diagnosis.—A small coral snake with the black ring in triads, the nuchal ring not part of the first triad, and with an extremely short tail; caudals 17–19 in female specimens, 21–22 in male specimens. The number of black rings on the tail is correspondingly reduced, with no more than one complete triad present in the specimens known.

Range.—Confined to the Santa Marta region in northeastern Colombia.

Colombian specimens.—I have available only four specimens, two males and two females (including the type and paratype of *hollandi*), with data. In addition to the type of *melanogenys* (which I have examined) I associate with this series two specimens without data, in the collection of the American Museum of Natural History.

***Micrurus dissoleucus nigrirostris* subsp. nov.**

Micrurus dissoleucus dunni Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser., 20: 203 (part).

Type.—Senckenberg Museum no. 20734, a male, from Barranquilla, Colombia, collected by Fr. Regel in 1897.

Diagnosis.—A coral snake of small size, with the black rings in triads, the nuchal ring not a part of the first triad; snout entirely black; ventrals 190–208 in males, 212–228 in females; caudals 23–27 in males, 17–22 in females; number of triads, in both sexes, six to eight.

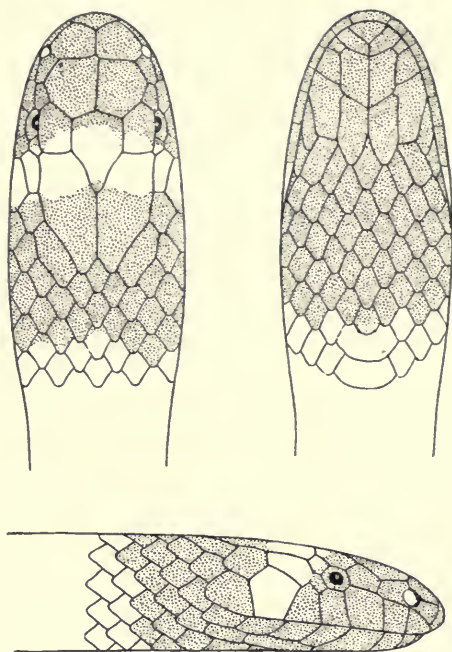


FIG. 68. Pattern of head of type of *Micrurus dissoleucus melanogenys*, ANSP no. 6807; $\times 4$.

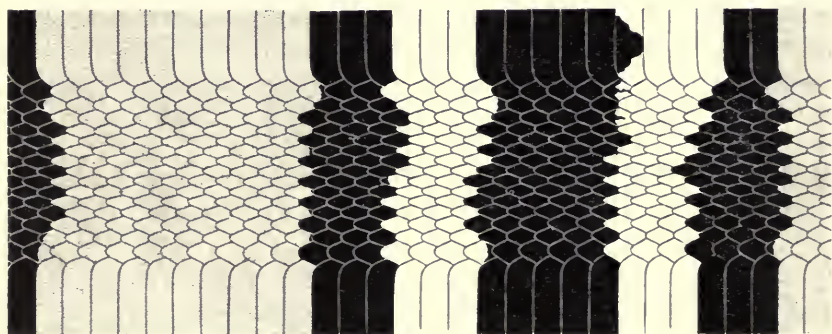


FIG. 69. Pattern of body in type of *Micrurus dissoleucus melanogenys*, ANSP no. 6807.

Description of type.—A coral snake of the *Micrurus dissolucus* group, with small head and rounded snout; rostral narrowly visible from above; internasals half as long as the prefrontals; frontal obtusely angulate in front, relatively wide; one preocular and 2 postoculars; the temporals on each side (i.e. the normally single anterior and posterior temporals) fused into a single elongate shield, followed by two shields posteriorly; 7 upper and 7 lower labials; scale rows 15 at the first widened ventral; ventrals 208, caudals 27, two of which are undivided.

Head black, with a yellow band from the fifth and sixth labials across the head, occupying the posterior two-thirds of the supra-oculars and frontal, the postoculars, the anterior half of the elongate temporal, and the anterior two-fifths of the parietals; lower labials and chin entirely dark except for the yellow posterior chin shields opposite the light band on the upper side of the head; black bands in triads, nuchal band not included in the first, seven complete triads on the body plus one and one-third on the tail (counting the black tail tip); black rings subequal above, the outer rings of the triads narrowed on the ventrals; the third triad in number of ventrals, as follows:

Red	Black	Yellow	Black	Yellow	Black	Red
9	4	3	5	3	4	9

Measurements of type.—Total length 355 mm., tail 27 mm.

Notes on paratypes.—I have examined seventeen specimens, in addition to the type, that are referred to this form. Of these one has no data; the specimen labeled as from Cartago may be explainable by a lapsus as coming from Cartagena; a specimen labeled "Trinidad" may be entirely mislabeled, or may be from some obscure Trinidad in Colombia unknown to me. The remaining specimens with positive and plausible data are from the region of the Magdalena delta or the lower Magdalena Valley.

The type is exceeded in length only by MCZ no. 29602, a female 367 mm. long, with tail 20 mm. There is a frequent tendency (as in Senck. no. 20735) for the reduction of the contact between the anterior and posterior temporals, so that the upper angle of the sixth labial may meet, or nearly meet, a lateral angle of the parietal. It is gratifying to note that the material now at hand confirms my prediction of 1936 that the Magdalena Basin specimens might be distinguishable from the Panamanian *dunni*.

Micrurus dissoleucus dunni Barbour

Micrurus dunni Barbour, 1923, Qcc. Papers Mus. Zool. Univ. Mich., **129**: 35
—Ancon, Canal Zone, Panama.

Micrurus dissoleucus dunni Schmidt, 1936, Field Mus. Nat. Hist., Zool. Ser.,
20: 203 (part).

Diagnosis.—A small coral snake with the nuchal black ring not a part of the first triad of black rings on the body; caudals in males 23–28; ventrals in female specimens more than 212; and triads of black rings on the body 8–11.

Range.—Panama from the Canal Zone eastward, the eastern boundary unknown, perhaps extending into Colombia.

Remarks.—The formal reference to *dunni* is included in order to complete the treatment of the species *dissoleucus*. The subspecies *dunni* probably occurs in northwestern Colombia. I am indebted to Mr. Arthur Loveridge for corrections of the original description of the type, which has 217 ventrals instead of 224, and measures 313 mm., tail 18 mm., instead of 130 mm. and 20 mm. Barbour stated that the light rings within the triads are red, which, on the analogy of the great majority of coral snakes, is highly improbable. He correctly discerned the close relation to *dissoleucus*, but his suggestion of a relation to *tschudi* of coastal Peru is rejected.

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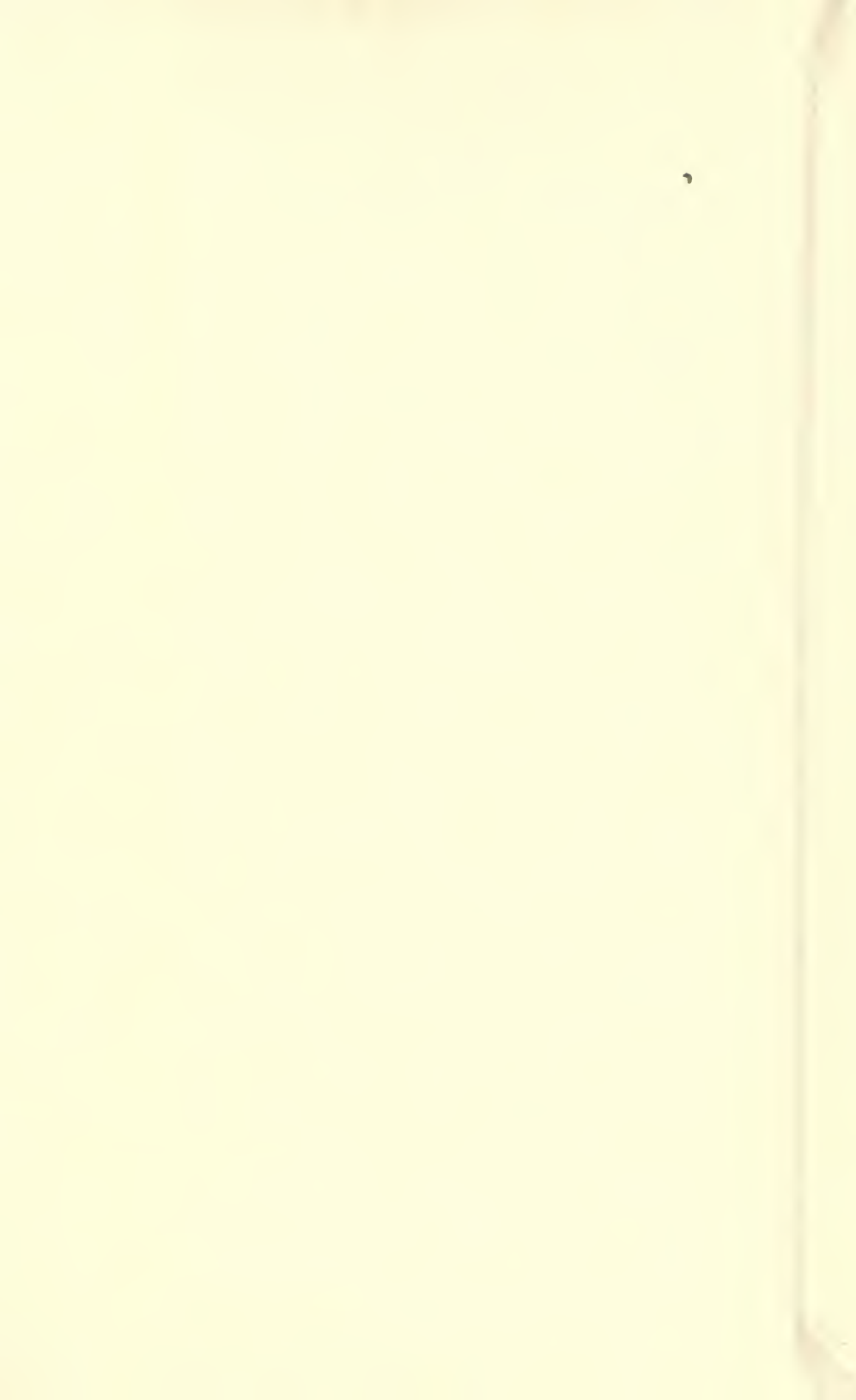
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